Activity B: Laboratory Capacity Operational Plan:

Objective 1: Expand and enhance molecular diagnostics capacity

BLS Staff will:

- Hire a new multi-purpose staff Bacteriologist III to implement new molecular methods.
- Implement CDC RT-PCR assays for measles, mumps, and rubella using existing automated nucleic acid extraction platforms (MagNA Pure LC for high specimen numbers and manual Qiagen extraction kits for low specimen numbers) and a real-time PCR platform (ABI7500 fast Dx), such that extraction and PCR kits for the new assays are interchangeable with those of existing assays.
- Implement protocol for detection of oseltamivir and adamantane resistance using existing PyroMark pyrosequencer platform, for surveillance purposes only, for the 2010-11 influenza season.
- Establish and maintain a Bionumerics genotyping database to track and compare specimens submitted for oseltamivir and adamantane surveillance, and in the 2nd grant year, calicivirus surveillance.
- Attend ELISpot training provided by the CDC.
- Attend a Molecular Virology Workshop training held by the Pan American Society for Clinical Virology.
- Attend the 27th Clinical Virology Symposium held by the Pan American Society for Clinical Virology.
- Use the mumps ELISpot assay during outbreak investigations in order to generate data for validation of the assay for routine diagnostic use.
- In the 2nd grant year, develop additional molecular assays including norovirus PCR and sequencing for CaliciNet.

Timeline (9/30/10 – 7/31/2011):

- Bacteriologist III is hired by 11/30/2010.
- ELISpot training at CDC is completed by 12/31/2010.
- An influenza resistance pyrosequencing method is implemented by 1/31/2011.
- A bionumerics genotyping database is established by 1/21/2011.
- Measles, mumps and rubella RT-PCR assays are implemented by 7/31/2011.
- Pyrosequencing-based influenza resistance surveillance data is compiled in aggregate by 7/31/2011.

Timeline (8/1/2011-7/31/2012)

- Develop additional molecular assays including norovirus PCR and sequencing for CaliciNet.

Objective 2: Reduce turnaround times for testing associated with foodborne disease surveillance

BLS Staff will:

- Hire a new Bacteriologist I to allow for faster Salmonella serotyping. This multi-use person will also be cross-trained to support enterics, PFGE, and food laboratory testing activities as needed.
- Purchase an additional BioRad CHEF Mapper®, to allow additional capacity to perform PFGE on multiple pathogens simultaneously.

- Monitor turnaround times for serotyping and PFGE to identify and address the causes of testing delays.

Timeline (9/30/10 – 7/31/2011):
- BioRad CHEF Mapper® is purchased and installed by October 31, 2010.
- Bacteriologist I is hired by 11/30/2010.
- Bacteriologist I is trained in Salmonella serotyping by 12/31/2010.
- Bacteriologist I is trained in PFGE and other microbiologic and molecular methods by 7/31/2011.

Timeline (8/1/2011-7/31/2012)
- Bacteriologist I continues to perform Salmonella serotyping and other laboratory tests that would not otherwise be performed in a timely manner.
- One additional lab staff will attend the 2011 National PulseNet meeting by 12/31/2011.
- Bacteriologist I is trained in PFGE and other microbiologic and molecular methods by 7/31/2012.

Objective 3: Integrate epidemiology, lab, and health information systems components within the health department and within the Northeast region

BLS Staff will:
- Continue to share relevant information between all Working Group on Foodborne Illness (WGFBI) members in real-time, and work together to ensure prompt collection and submission of suspect foods to the BLS.
- Attend monthly meetings with epidemiologists representing the DPH Immunizations Program, and semi-monthly meetings with epidemiologists representing the DPH Epidemiology Program.
- Attend the Northeast Environmental and Public Health Laboratory Directors (NEEPHLD) meetings attended by MA, NY, RI, ME, CT and VT to discuss ELC related-issues and share best practices.
- Lab staff will present at the 2010 Northeast Epidemiology Conference.

Timeline (9/30/10 – 7/31/2011):
- Lab staff will attend routine meetings with epidemiologists as described above, and will attend additional meetings as needed to address acute public health threats.
- Lab staff will present at the 2010 Northeast Epidemiology Conference in Lenox, MA.

Timeline (8/1/2011-7/31/2012)
- Lab staff will attend routine meetings with epidemiologists as described above, and will attend additional meetings as needed to address acute public health threats.

Organizational challenges:

The MDPH hiring system requires a minimum of 3-4 weeks to identify a selected candidate. Laboratory personnel also require a minimum of an additional 3 weeks for initial training to establish competency in testing methods. Job opportunities will be posted immediately upon notification of award. In kind contributions from multiple existing laboratory personnel will be used to expedite training of new personnel, and to meet project activity needs while new personnel complete initial training.

Measures of Impact and Effectiveness:

Objective 1:

- ELISpot training at CDC is completed by 12/31/2010.
- Staff are trained on pyrosequencing and new PCR assays by 7/31/2011 (laboratory methods for which staff are proficient will increase by 4).
- Beginning 8/1/2011, all suitable specimens submitted for measles, mumps or rubella testing will be tested by PCR. Results will be produced for at least 85% of suitable specimens within 2 business days.
- One staff will attend the Molecular Virology Workshop held by the Pan American Society for Clinical Virology by May 7, 2011.
- Two staff will attend the 27th Clinical Virology Symposium held by the Pan American Society for Clinical Virology by May 11, 2011.

***Objective 2*:**

- Beginning in 12/15/10, 100% STEC, 80% *Listeria,* and 95% *Salmonella* PFGE patterns are uploaded to PulseNet within four days of receipt of the isolate to the PFGE lab. Currently, 93% of STEC, ~63% of *Listeria*, ~88% of *Salmonella* are uploaded within 4 days.
- Beginning 12/15/10, *Salmonella* serotyping data are available for at least 50% of isolates within 7 days of receipt of isolate (currently 14% are serotyped within 7 days, 50% within 21 days).

***Objective 3*:**

- Lab staff will collaborate with public health epidemiologists to respond to at least 5 acute public health threats by 07/31/2011.
- Lab staff will present at the 2010 Northeast Epidemiology Conference by 11/05/2010.